PHMC Environmental Management Performance Report – August 2000 Section C:1 – Nuclear Material Stabilization



Section C:1 *Nuclear Material Stabilization*

PROJECT MANAGERS

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SUMMARY





"The June 27-30 Hanford fire resulted in a \$1.3M impact to the Nuclear Materials Stabilization Project."

The Nuclear Material Stabilization mission consists of the Plutonium Finishing Plant (PFP), WBS 1.4.5, PBS TP05.

NOTE: Unless otherwise noted, the Safety, Conduct of Operations, Milestone Achievement, and Cost/Schedule data contained herein is as of June 30, 2000. All other information is as of July 13, 2000 unless otherwise stated.

As of July 13, 2000 a total of 317 cans of Plutonium oxides and sludges have been stabilized through thermal stabilization (27 additional items since last report). A total of 13 liters of Plutonium nitrate solution have been stabilized in the prototype vertical denitration calciner [no change since December 1999 due to focus on Mg(OH)₂ Precipitation Process installation activities].

As of July 13, 2000, there have been 227 days without a lost workday injury, attributed to following Integrated Safety Management System (ISMS) principles.

Fiscal-year-to-date milestone performance (EA, DOE-HQ, and RL) shows that three of ten milestones (30 percent) were completed on or ahead of schedule, one completed late (10 percent), and six (60 percent) are overdue. No milestones were scheduled for completion during this report period. Further details can be found in the milestone exception report following the cost and schedule variance analysis.

ACCOMPLISHMENTS

Maintain Safe and Compliant PFP

- As of July 13, 2000, there have been 227 days without a lost workday injury.
- Corrective actions for systematic items identified by the Deficiency Evaluation Group are being addressed and completed.
- Completed the Integrated Safety Management System (ISMS) verification process and presented subsequent briefing to DOE-RL. Results indicated there were no opportunities for improvement requiring immediate action.
- Developed and completed initial Hanford Site fire recovery plan and assisted other facilities with

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their recovery plan development.

• Transferred heat source to electricity for plant sanitary water to reduce reliance on steam.

Maintain Safe & Secure SNM

 Increased material transfers and Non Destructive Assays (NDA) to support enhanced thermal stabilization processing.

Oxides/Metals/Polycubes Stabilization

- Completed stabilization of 317 Plutonium (Pu) oxide items as of July 13, 2000 including seven (7) oxidized metal items and four (4) oxides that were shipped offsite.
- Successfully restarted the stabilization process after the Hanford Site fire and subsequent material inventory.

Solution Stabilization

• Received RL approval of the Plan of Action for the Mg(OH)₂ Operations Readiness Review (ORR).

Residue Stabilization

- Submitted revised Part A permit to Ecology to provide for RCRA permitted storage at the Plutonium Finishing Plant (PFP).
- Designation of Sand Slag and Crucible as debris eliminates WIPP sampling requirements.
- Completion of Notice of Construction review for Pipe-n-Go.
- Eighty-eight (88) Pipe Overpack Containers (POCs) are now ready for shipment to Hanford
- Repair of the existing floor in room 192D was successfully completed July 17, 2000 avoiding impact to schedule, radiological concerns, and waste disposal costs. The epoxy coating used in lieu of removal and replacement of the floor, resulted in a cost savings of approximately \$220,000.

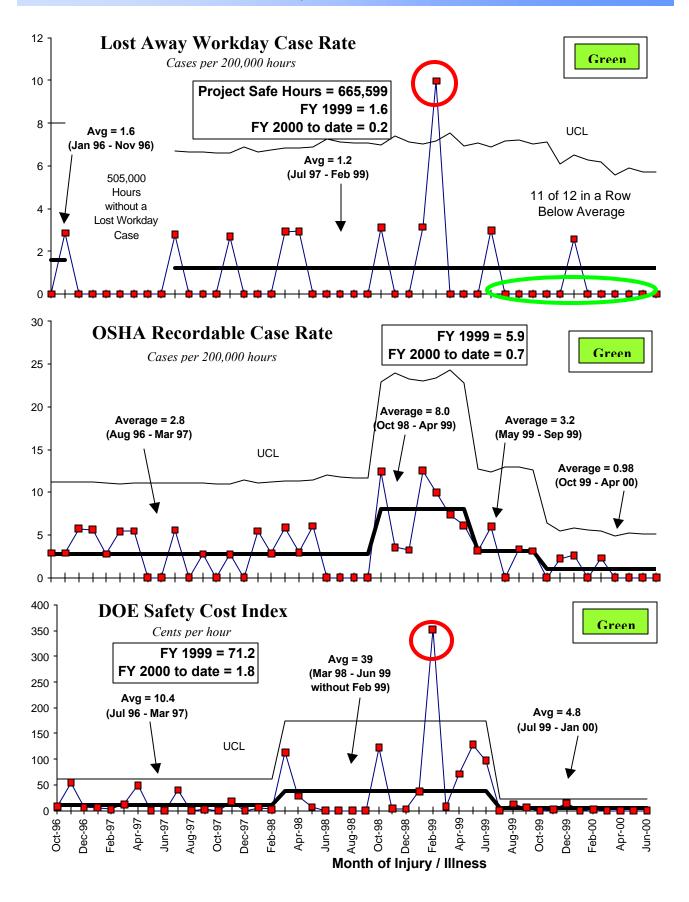
Project W-460

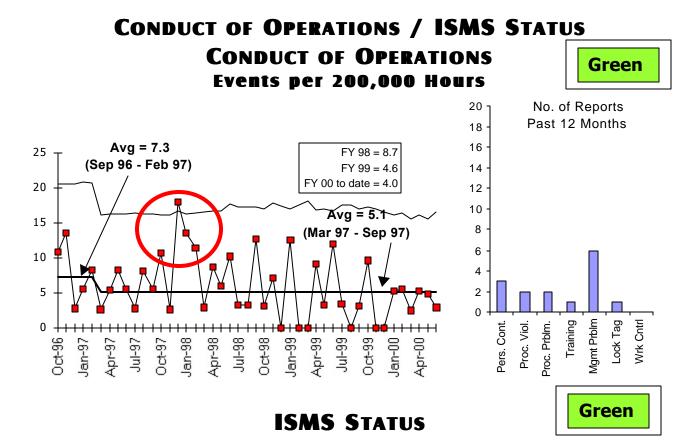
- Approval of the Notice of Construction (NOC) for the 234-5 Bagless Transfer System (BTS) was received from the Washington State Department of Health.
- Completed RL revalidation of Project W-460-authorizing funding for FY 2002.
- RL approved Critical Decision #2, to complete design and long lead procurement, for project W-460.

SAFETY

Lost Away Workday Case Rate has had a significant decrease, with 11 of 12 months in a row below average. Current rate is exceptionally low. Occupational Safety and Health Act (OSHA) recordable case rate has significantly improved in comparison to the adverse trend of Spring 1999.

FY 2000 OSHA case rate and DOE Safety Cost Index are very favorable. DOE Safety Cost Index has been six months in a row below average. The Index has both a new average and control limits reflecting the significant decrease noted earlier in the year.





• NMS project has met the objectives established for Phase II ISMS verification.

BREAKTHROUGHS / OPPORTUNITIES FOR IMPROVEMENT Breakthroughs

- WIPP-Validated NDA System -- Implementation of a Waste Isolation
 Pilot Plant (WIPP) "validated" plutonium-measuring NDA system in
 FY 2000 continues. The equipment necessary to upgrade the Segmented Gamma Scanner has been delivered and upgrades have been initiated.
- Furnaces This document provides the test results of the process currently used at the Plutonium Finishing Plant (PFP) for producing stable plutonium dioxide. The testing results show that the materials fed into the furnaces are being heated to at least 950°C for at least two hours as required by the Department of Energy Standard 3013-99.
- Rocky Flats Ash Identification of existing Rocky Flats ash sources that should eliminate the need to fabricate new-segmented gamma scanner source standards.

Green

Green

Opportunities for Improvement

Project Baseline Control – A number of cost control measures are in place, and actively managed, to mitigate the current budget deficit.
 These include reductions in contract costs, overtime, material procurements, and suspension of non-critical hiring.

• Exposure Reduction – Methods are being implemented to reduce exposure to 2736-ZB vault staff. These As Low As

Reasonably Achievable (ALARA) reduction methods include: remote surveillance (robotic), additional shielding, and full scale mock up vault cubicles.

• Second Brazilian Thorium Sludge (BTS) and Outer Can
Welder for Project W-460— Discussions are underway with
Westinghouse Savannah River Company to provide an accelerated delivery date for the Second BTS and Outer Can Welder for Project W-460. Funding has been allocated to Savannah River for design, construction, and delivery of the outer can welder.

• **Preventive Maintenance/Surveillance Activities** – A recovery plan is being developed to reduce the backlog caused by the Hanford Site fire.



UPCOMING ACTIVITIES

- Begin Pu solution stabilization via Mg(OH)₂ in September 2000.
- Complete glovebox installation in July 2000.
- Complete ORR and training activities for stabilization activities in room 230-C in September 2000.
- Startup Residues operations in fourth quarter of FY 2000.
- Complete installation and startup of the 234-5Z Bagless Transfer System (BTS) in fourth quarter of FY 2000.
- Begin metal stabilization processing in November 2000.
- Initiate polycube stabilization in first quarter of FY 2001.

COST PERFORMANCE (\$M):

	BCWP	ACWP	VARIANCE
Nuclear Material Stabilization	\$80.0	\$89.7	(-\$9.6)

The \$9.6 million (12 percent) unfavorable cost variance is mostly driven by overruns in Solution Stabilization, Maintenance, and Training. Increased resources for the Mg(OH)₂ glovebox design, procurement and installation have been necessary to maintain the aggressive schedule demands. The cost overruns are somewhat offset by underruns in other areas due to a shortage of staff.

SCHEDULE PERFORMANCE (\$M):

	BCWP	BCWS	VARIANCE
Nuclear Material Stabilization	\$80.0	\$94.7	(-\$14.7)

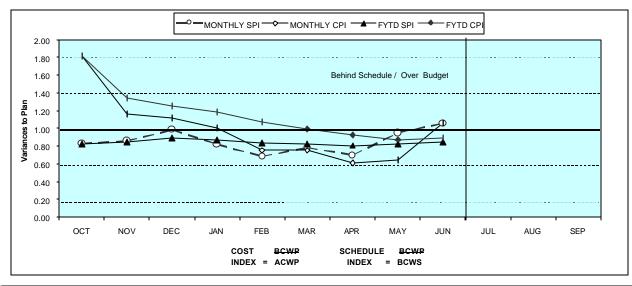
The \$14.7 million (15 percent) unfavorable schedule variance is due to the behind status on Project W-460, the Plutonium Stabilization and Packaging System, capital activities, such as the elimination of trailers and vault modification design. Facility construction modifications have not started as scheduled due to deviations in the definitive design, required changes to the National Environmental Policy Act (NEPA) Supplemental Analysis and approval of the Notice of Construction by the Washington State Department of Health. Residues and solution stabilization activities are also the behind schedule. Solution stabilization construction activities are two months behind schedule, with startup now planned for September 2000. Restart activities for residues are behind schedule and additional NDA equipment necessary for WIPP validation has been ordered. Restart of residue disposition activities (i.e., Pipe-n-Go of ash) is now anticipated in the fourth quarter of FY 2000, versus the planned April 2000 restart. Oxide stabilization activities continue significantly ahead of schedule.

FY 2000 Cost/Schedule Performance - All Fund Types Cumulative to Date Status - (\$000)_____

		FYTD							Tellow		
В	y PBS	BCWS	BCWP	ACWP	sv	%	CV	%	PEM	EAC	
WBS 1.4.5 PBS TP05	PFP Deactivation	\$ 94,711	\$ 80,038	\$ 89,675	\$ (14,674)	-15%	\$ (9,637)	-12%	\$ 124,750	\$ 122,994	
	Total	\$ 94,711	\$ 80,038	\$ 89,675	\$ (14,674)	-15%	\$ (9,637)	-12%	\$ 124,750	\$ 122,994	

RL-Directed costs (steam) are included in the PEM BCWS.

COST/SCHEDULE PERFORMANCE INDICES (MONTHLY AND FYTD)



EV 2000	OCT	NOV	DEC	JAN	FER	MAR	APR	MAV	JIIN	ли.	AUG	SEP
MONTHI Y SPI	0.83	0.85	0.98	0.82	0.68	0.78	0.70	0.95	1.06			~
MONTHLY CPI	1.81	1.16	1.11	1.01	0.75	0.75	0.61	0.64	1.06			
FYTD SPI	0.83	0.84	0.89	0.87	0.83	0.82	0.81	0.82	0.85			
FYTD CPI	1.81	1.34	1.25	1.18	1.07	0.99	0.93	0.87	0.89			
MONTHI Y RCWS	\$7,913	\$12.725	\$9.999	\$10.540	\$11.128	\$13,401	\$9.632	999	\$9 375	\$9.170	\$11.161	\$9.707
MONTHLY BCWP	\$6,543	\$10.873	\$9.849	\$8,638	\$7.567	\$10,480	\$6.704	\$9,474	\$9,910	,	. , .	1 7
MONTHLY ACWP	\$3,613	\$9,386	\$8.845	\$8,587	\$10.085	\$13,961	\$10.988	\$14.826	\$9,383			
FYTD BCWS	\$7.913	\$20,638	\$30,637	\$41.177	\$52,305	\$65,706	\$75,338	\$85,336	\$94.711	\$103.882	\$115.043	\$124,750
EYTD RCWP	\$6.543	\$17.416	\$27.265	\$35,903	\$43,470	\$53,950	\$60,654	\$70.128	\$80.038			
FYTD ACWP	\$3,613	\$12,999	\$21.844	\$30,431	\$40.516	\$54,477	\$65,465	\$80,292	\$89,675	•		

COST VARIANCE ANALYSIS: (-\$9.6M)

WBS/PBS <u>Title</u>

1.4.5.1.13/TP05 Stabilization of Nuclear Materials (-\$5.6M)

Description and Cause: The unfavorable cost variance is due primarily increased plant support needed for procurement and installation of the Mg(OH)₂ glovebox and equipment, and other construction activities, and use of subcontract staff augmentation.

Impact: Construction not started on time; cost overruns can hurt overall plant project funding. **Corrective Action:** Acceleration of schedule for procurement, construction is now complete and startup has been implemented.

1.4.5.1.15/TP05 Transition PFP (-\$0.4M)

Description and Cause: Carryover scope from FY99 (Sampling follow-on, NDA); unforeseen lab costs due to PCBs; evaluation of remedial alternatives

Impact: Deferred tank characterization until FY 2001, no major impact identified.

Corrective Action: BCR funding \$395K, using FY 1999 carryover funds was implemented this month creating the positive cost variance. Balance is on funds management. Stopped work on largest remaining contract, minimal effort and cost for balance of FY.

1.4.5.1.12/TP05 PFP Fee Allocation (-\$.9M)

Description and Cause: Unfavorable cost variance due to point adjustment (-\$471K) in May to adjust for delay in staff hiring ramp-up at the beginning of FY 2000. An increase in the fee accrual rate from 90 percent to 100 percent also is a contributory factor.

Impact: No impact.

Corrective Action: None required.

SCHEDULE VARIANCE ANALYSIS: (-\$14.7M)

WBS/PBS <u>Title</u>

1.4.5.1.14/TP05 Disposition of Nuclear Material (-\$9.4M)

Description and Cause: The unfavorable schedule variance is primarily due to delays in Line Item Project W-460, Plutonium Stabilization and Packaging System, definitive design and construction. Facility construction modifications have not yet started as scheduled, due to deviations to the Definitive Design, required changes to the NEPA Supplement Analysis and approval of the Notice of Construction (NOC) by the Washington State Department of Health (WSDOH).

Impact: Potential delay in the startup of the Bagless Transfer and Stabilization system in 2736-ZB, which can impact stabilization activities in FY 2001.

Corrective Action: To assist in the recovery, a second BTS unit is being installed in the 234-5Z facility, which will enable BTS unit operation in FY 2000 as originally planned. Project W-460 management and WSDOH staffs are aggressively working to approve the NOC, which will enable construction to begin.

1.4.5.1.13/TP05 Stabilize SNM (-\$5.3M)

Description and Cause: The unfavorable schedule variance is due to the behind status on Project W-460, the Plutonium Stabilization and Packaging System, capital activities, such as the elimination of trailers and vault modification design. Facility construction modifications have not started as scheduled due to deviations in the definitive design, required changes to the NEPA Supplemental Analysis and approval of the Notice of Construction by the WSDOH. The negative schedule variance is also due to the behind schedule status on residues and solution stabilization activities. Solution stabilization construction activities are two months behind schedule, with startup now planned for September 2000. Restart activities for residues are behind schedule and the need for additional NDA equipment necessary for Waste Isolation Pilot Plant (WIPP) validation has been ordered. Restart of residues is now anticipated in August of FY 2000, versus the planned April 2000 restart. Oxide stabilization activities continue significantly ahead of schedule.

Impact: Potential delay in the startup of the Bagless Transfer and Stabilization System in 2736-ZB which could impact stabilization activities in FY 2001.

Corrective Action: To assist in the recovery, a second BTS unit is being installed in the 234-5Z facility, which will enable BTS unit operation in FY 2000 as planned.

FUNDS MANAGEMENT FUNDS VS. SPENDING FORECAST (\$000) FY TO DATE THROUGH JUNE 2000 (FLUOR HANFORD, INC. ONLY)

	Project Completion *			Post 2006 *			Line Items *		
	Expected Funds	FYSF	Variance	Expected Funds	FYSF	Variance	Expected Funds	FYSF	Variance
The Plateau									
1.4.5 Nuclear Materials Stabilization TP05 Operating	112.955	116.069	(3.114)						
Line Item Total Nuclear Mat. Stab. Operating	\$ 112.955	\$ 116.069	\$ (3.114)				17.577	10.058	7.519
Total Nuclear Mat. Stab. Line Item							\$ 17,577	s 10,058	\$ 7,519

^{*} Control Point

ISSUES

Technical Issues

Sixty-three (63) items have not met Loss On Ignition criteria for repackaging.

Impact: Reprocessing/retest of material could potentially impact the overall processing schedule and increase employee dose rates.

Corrective Action: A supercritical fluid extraction system designed specifically for moisture measurements has been purchased and is expected to be operational in September, 2000.

DOE/Regulator/External Issues

- RCRA Permitting Part A revision for adding ignitability waste code was submitted to Ecology in support of Cementation startup.
- RCRA Permitting in support of Pipe-N-Go:
 - A revised Notice of Intent (NOI) to define storage locations at Plutonium Finishing Plant (PFP) was released for public review.
 - The required interim status Cementation documents, necessary to work under a Part A RCRA permit, have been completed and were submitted by RL to Ecology on July 20, 2000. These documents include inspection, waste analysis, training, emergency/contingency and closure plans. Revised Part A to provide permitted storage at PFP has been transmitted to Ecology. Approval of Part A by Ecology is required prior to startup.
- Update interface agreement between PFP and Waste Management to define requirements and

responsibilities to support CWC and Waste Isolation Pilot Plant acceptance of packaged residues.

• The PFP has requested DOE-RL to assist in expediting development of the Safety Analysis for Packaging Report (SARP) or Safety Evaluation for Packaging (SEP) required for transporting pipe overpack containers (POCs) from PFP to the Central Waste Complex.

BASELINE CHANGE REQUESTS CURRENTLY IN PROCESS

PROJECT CHANGE NUMBER	DATE ORIGINAL	BASELINE CHANGE REQUEST TITLE	COST IMPACT (\$000s)	SCH	ТЕСН	DATE TO FHI CCB	CCB APR'VD	RL APR'VD	CURRENT STATUS
FSP-2000-001	13-Oct-99	Delete TRP-99-419, Complete Install. of Production Scale Vertical Calciner	\$0						On hold
FSP-2000-005	30-Nov-99	Implement PFP Int Proj Mgmt Plan Addendum I	\$659	X	X				In work
FSP-2000-032	5-Apr-00	2nd Bagless Transfer System at PFP	(\$1,500)	X	X	6-Apr-00	7-Apr-00	16-Jun-00	Complete
FSP-2000-043	1-May-00	Video Control Camera	\$0	X	X				On hold due to budget constraints
FSP-2000-049	8-Jun-00	Submit Hanford. Materals Forecast to RL (revise TRP-00-103 date)		X		16-Jun-00	21-Jun-00		At DOE-RL for approval
FSP-2000-050	9-Jun-00	W-460; procure calorimeters/outer can welder	\$2,600	X	X	16-Jun-00			At FHI CCB for approval
FSP-2000-051	16-Jun-00	HEPA Filter Vulnerability Assesment	\$38	X	X				In Work
FSP-2000-053	1-May-00	Backflow Preventers	\$160	X	X				In work
FSP-2000-045	30-Nov-99	Implement PFP Int Proj Mgmt Plan Addendum I	\$0	X	X				In work at PFP

MILESTONE ACHIEVEMENT

		FISCAL YE <i>A</i>	AR-TO-DATE	REMAIN				
MILESTONE TYPE	Completed Early	Completed On Schedule	Completed Late	Overdue	Forecast Early	Forecast On Schedule	Forecast Late	TOTAL FY 2000
Enforceable Agreement	1	1	0	0	0	0	0	2
DOE-HQ	0	0	0	1	0	0	0	1
RL	1	0	1	5	0	4	0	11
Total Project	2	1	1	6	0	4	0	14

Tri-Party Agreement / EA Milestones

Tri-Party Agreement Milestone M-15-37A (TRP-00-501), "Deliver Two (2)

Tank Z-241-Z-361 Core Samples to 222-S", due 10/30/99

Green

• Completed 1 month early (9/28/99)

Tri-Party Agreement Milestone (TRP-00-511), "Deliver Two (2)

Tank 241-Z-361 Core Sample Validated Data Packages to EPA", due 5/31/00

Completed On Schedule

Green

DNFSB Commitments

DNFSB Milestone IP-113 (TRP-00-500), "Install 2 LANL Pyrolysis Units for Stabilization of Polycubes at PFP", due 12/31/99

Green

• A BCR to remove pyrolysis stabilization of polycubes and implement thermal stabilization in its stead has been approved by RL and implemented into the baseline.

MILESTONE EXCEPTION REPORT

			Baseline	Forecast
Number/WBS	<u>Level</u>	Milestone Title	<u>Date</u>	<u>Date</u>

OVERDUE - 6

TRP-00-103 RL Submit Hanford Materials Forecast to 05/15/00 06/02/00

1.4.6 DOE-RL

Cause: RL established a later completion date of June 16.

Corrective Action: A BCR has been prepared to change the baseline date to June 16. The milestone was completed on June 2.

TRP-00-504 RL Restart Cementation Operations 04/21/00 FY 2001

1.4.5

Cause: Stabilization processing has been re-sequenced.

Corrective Action: None, as the global stabilization end point will remain the same.

TRP-00-500 HQ Install Two Los Alamos National 12/31/99 Proposed 1.4.5 Laboratory (LANL) Pyrolysis Units for Deletion

Stabilization of Polycubes

Cause: See DNFSB Commitment above.

Corrective Action: A BCR to remove pyrolysis stabilization of polycubes and implement thermal stabilization in its stead has been approved by RL and implemented into the baseline. However, this is a

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HQ milestone and cannot be removed from the list.

TRP-00-510 RL Complete Annual Revision to IPMP 05/31/00 07/31/00

1.4.5

Cause: Comment resolution has taken longer than anticipated.

Corrective Action: None.

TRP-00-508 RL Complete 2 of 5 Criticality Alarm Panel 06/30/00 Proposed (CAP) Upgrades Deletion 1.4.5

Cause: Pending deletion upon approval of Baseline Change Request

Corrective Action: None

TRP-00-502 RL Complete Criticality Analysis & Issue 06/30/00 07/31/00

Spec. for Metal Processing 1.4.5 Cause: Delayed by higher priority solutions analysis.

Corrective Action: None

FY 1999 OVERDUE - 2

TRP-99-419 RL Complete Installation of Production 09/30/99 Proposed 1.4.5 Deletion Scale Vertical Calciner

Cause: The production scale vertical calciner has been replaced with the Magnesium Hydroxide

Precipitation process.

Impact: No impact. This milestone is obsolete.

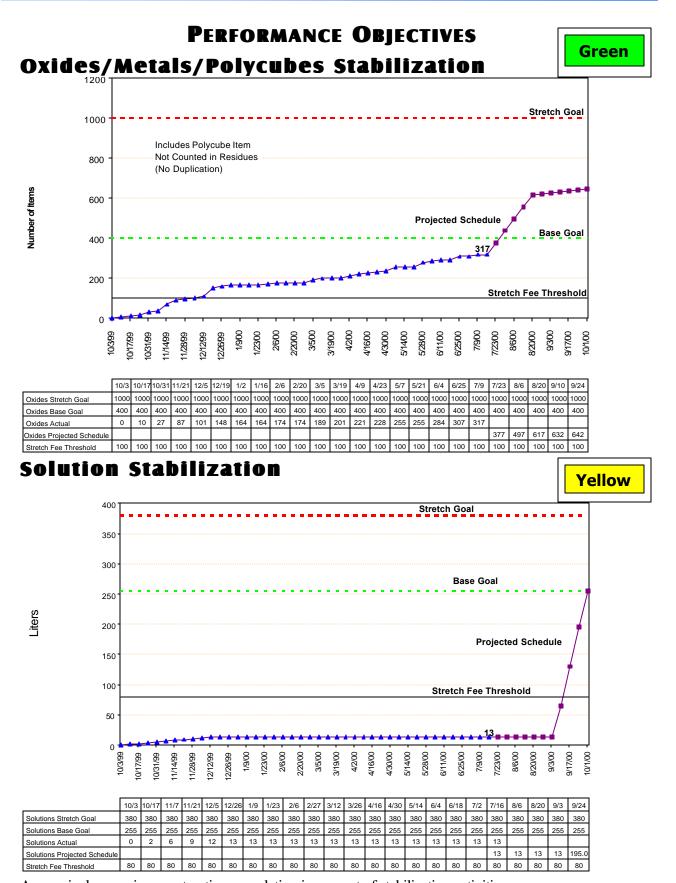
Corrective Action: Since installation and testing of the production scale vertical calciner is an EM-65 Management Commitment, the Department of Energy, Richland Office (DOE-RL) change control process cannot remove this milestone.

TRP-99-500 HO Complete Installation & Testing of 09/30/99 Proposed Deletion **Production Vertical Calciner**

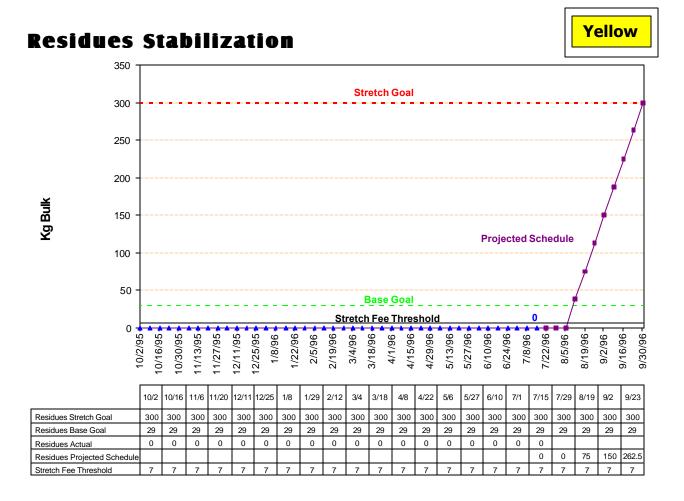
Cause: The production scale vertical calciner has been replaced with the Magnesium Hydroxide Precipitation process.

Impact: No impact. This milestone is obsolete.

Corrective Action: Since this milestone is a DOE-HQ milestone and is part of the DOE-HQ 1998 DNFSB Recommendation 94-1 Implementation Plan, the Department of Energy, Richland Office change control process cannot remove this milestone. However, this milestone will be removed upon approval of the revised DOE-HQ DNFSB Recommendation 94-1 Implementation Plan.



Aggressively pursuing construction completion in support of stabilization activities.

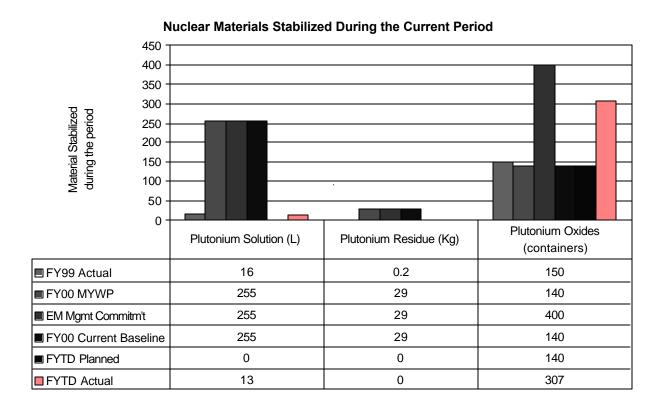


Update baseline schedule for new cementation start-up date and adjust ash schedule for preparatory work.

KEY INTEGRATION ACTIVITIES

- Working on interface agreement between PFP and Waste Management to define requirements and responsibilities to support Central Waste Complex (CWC) and WIPP acceptance of packaged residues.
- Continue work with Rocky Flats to procure containers (Pipe-n-Go) to support PFP Residue Stabilization without the need for another procurement action. Work continues with Rocky Flats to reach a joint resolution to PFP stabilization heating process.
- Joint PNNL/Plutonium Process Support Laboratories (PPSL) Mg(OH)₂ continues:
 - Status meeting with PNNL, PFP and DOE RL.
 - PPSL preparing to conduct scale testing with test set up developed by PNNL.
 - Downloaded solutions (1 product receiver (PR) container) in room 227 to support Phase II testing by PPSL.

NUCLEAR MATERIALS STABILIZED DURING THE CURRENT PERIOD

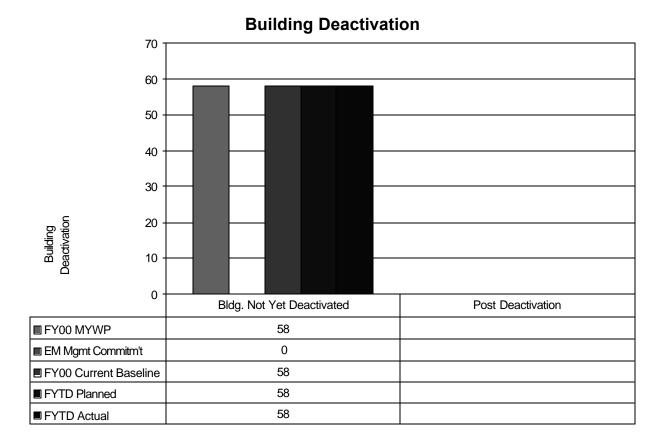


Plutonium Solution: Laboratory testing resulted in early stabilization of 13 liters of Plutonium solution during first quarter FY00. As planned no additional stabilization of plutonium solutions were made during the second and third quarters.

Plutonium Residue: Metal/oxide stabilization was extended thru the third quarter, whereupon the focus will now be switched towards the stabilization of the solutions and residues. It is currently expected that planned quantities of stabilization of residue, solution and metal oxide will be met or exceeded for FY2000.

Plutonium Oxides: 307 cans of metal/oxides have been stabilized to date exceeding the planned quantity of 140. Approval of EIS via supplement analysis increasing charge size of furnaces by a factor of four and increasing the number of furnaces from two to five has allowed the actual stabilization to proceed faster than planned. Metal/oxide stabilization was extended through the third quarter, whereupon the focus will now be switched towards the stabilization of the solutions.

BUILDING DEACTIVATION



Buildings Not Yet Deactivated: Deactivation of buildings will not begin until FY2009 as documented in the Integrated Project Management Plan for the River Corridor

Post Deactivation: There are no buildings in post deactivation.